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Success Factors for ICT Shared Services in the Higher Education Sector

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ABSTRACT

Shared services is a prominent organizational arrangement for organizations, in particular for support functions. The success (or failure) of shared services is a critical concern as the move to shared services can entail large scale investment and involve fundamental organizational change. The Higher Education (HE) sector is particularly well poised to benefit from shared services as there is a need to improve organizational performance and strong potential from sharing. Through a multiple case study of shared services experiences in HE, this study identifies ten important antecedents of shared services success: (1) understanding of shared services; (2) organizational environment, (3) top management support, (4) IT environment, (5) governance, (6) process centric view, (7) implementation strategy, (8) project management, (9) change management and (10) communication. The study then develops a preliminary model of shared services success that addresses the interdependencies between the success factors. As the first empirical success model for shared services, it provides valuable guidance to practice and future research.

Keywords: shared services, success factors, case study, Higher Education, NVivo analysis.

INTRODUCTION

Universities are looking to 'shared services' as a means of improving organizational performance (Wagenaar, 2006). This paper reports a multiple case study of shared services success factors in the higher education sector.

Shared services is an organization redesign option that gives primacy to the efficiency of corporate functions and can be seen as an alternative to outsourcing (Sako, 2010). Traditionally, shared services entails the consolidation of replicate business functions; predominantly support functions like Finance, Human Resources or Information Technology (IT), into a separate unit which provides customer oriented services to the originating business units (e.g. Bergeron, 2003; Schulman, Harmer, Dunleavy, & Lusk, 1999). Nowadays, we see a broader conceptualization of shared services to also include sharing across organizations (e.g. Janssen & Joha, 2006b; Wang & Wang, 2007) and sharing without a separate unit (e.g. Bækgaard, 2009; Gibson & Arnott, 2005). For the purposes of this paper, we adopt the more contemporary and inclusive definition of shared services: "*a collaboration strategy of multiple organizational units for providing and using services*"

Information Systems (IS) have dual relevance to shared services as both a support function amenable to the shared services arrangement and as a key enabler of shared services across other support functions. The adoption of shared services for the IS function is growing rapidly (Lacity & Fox, 2008; Peters & Silver, 2005), though it is not as widespread as in Finance or HR. Shared services has the potential to amplify IT related benefits through faster, more accurate process coordination and execution, and greater accuracy of and visibility into organizational data (Seddon, Calvert, & Yang, 2010). However, shared services may also require (radical) change to the IS applications and infrastructure because, for example, of the need to balance corporate-wide standardization with business unit specific customization.

There have been numerous reports in the practitioner press of successful private sector shared services implementations, and related potential benefits (Bergeron, 2003; Deloitte, 2009) – e.g. General Electric (Lacity & Fox, 2008), Digital Equipment Corporation (Lacity & Fox, 2008), and Reuters Asia (Business Intelligence, 2005; Lacity & Fox, 2008). Leading research firms such as Gartner (Gartner, 2008) provide a range of reports that describe shared services in different industries, stating that “*many enterprises are looking to shared services to support efficiency goals and to enhance business integration and agility*” (p. 2). Sharing typically aims to gain benefits of scale, including: (1) reduced duplication of effort, (2) improved cost control, (3) leveraging solutions to common problems, (4) leveraging expertise and advanced technology, and (5) improved services with limited resources (Dove, 2004; Miskon, Bandara, Fieft, & Gable, 2010; Yee, Tan, & Chan, 2009).

Anecdotal evidence suggests that universities are good candidates for shared services (Dove, 2004; Yee, et al., 2009), are embracing shared services, and have much potential to further exploit sharing arrangements. Environmental drivers contributing to increased interest in shared services within the HE sector include: continuing growth in student numbers, changes in the nature of academic work, increasing competition between institutions, government pressure to improve operational efficiency, and the diverse and shifting expectations of stakeholders (Deloitte Touche Tohmatsu, Flinders University of South Australia, & University of South Australia, 2001; KPMG, 2006). These substantial and continuing shifts in the sector demand more efficient and improved processes. Universities thus seek to identify services that can be managed more effectively within a sharing arrangement to provide better services at lower costs. Consequently, many HE institutions are considering cooperating or sharing in a wide range of areas.

The HE Sector entails a unique context for shared services. Universities have been described as combining “*hierarchical administration with a peer philosophy that views professors as self-governing colleagues (or a community of scholars), a tenure system for job security, an ethic of academic freedom within a highly regulated and bureaucratized system, decentralized departments that often operate independently rather than as part of an organization, and myriad constituencies served by the university*” (Barsky, 2002, p. 161). Thus, while prior studies on shared services from other industry contexts can provide useful insights, it is believed that studies specific to the HE context are required to provide insights that are genuinely relevant to shared services within the HE sector.

The success (or failure) of shared services is a critical concern as implementing shared services can entail large-scale investment and involve fundamental organizational change, impacting people, processes and technology. Anecdotal evidence (Craike & Singh, 2006; Janssen & Joha, 2006b; Lawson, 2007; Shah, 1998) suggests that many organizations have difficulty understanding the context and details of shared services. Practitioner reported outcomes for shared services initiatives have been mixed (e.g. Accenture, 2005; Deloitte, 2007), suggesting value from an academic investigation of the phenomena, yet academic research has paid little attention to shared services best practices. In particular, we note a dearth of discussion on shared services success factors, i.e. those factors whose existence implies a benefit to the shared services initiative and/or factors that are critical to improve the level of success experienced (adopted from Rockart (1979)). This study aims to address this knowledge gap by investigating the following research question: ***“What are the important success factors of shared services, in the higher education sector?”***

Studies of success factors are common in emerging areas as they can provide guidance to practice on what to emphasize and what to avoid. For example, studies have identified a range of factors influencing the perceived success of systems implementations, including social, organizational, cultural and political factors (Bandara, Gable, & Rosemann, 2005; Gable, 1999; Love & Irani, 2004). A better understanding of the success factors is important for the progression and success of shared services. For example, success factors can help better understand the nature of shared services organizations (A.T. Kearny, 2004) and support the design and deployment of shared service structures and governance (Firecone, 2007). Understanding success factors can form a strong foundation when deriving procedural guidelines on the design, implementation and on-going management of shared services (Borman, 2008; Burns & Yeaton, 2008).

Rigorous research attention to shared services success factors has been limited. Miskon et al. (2011) provide a detailed list of shared services success factors based on an archival analysis of the Information Systems literature. Walsh et al. (2008) present shared services success factors based on lessons learnt from studying the non-profit sector. Burns & Yeaton (2008), present a report that assesses lessons learned from government organizations that have successfully implemented shared services. Becker et al. (2009), though not a success factor study, discuss factors that are important preconditions for shared services. Borman (2008) highlights several attributes that could be considered prerequisites for shared services success.

Prior studies that directly or indirectly discuss shared services success factors have limitations. In several studies, factors were identified as a secondary outcome - as part of lessons learnt from a shared services implementation (e.g. Walsh, et al., 2008) or as a side contribution where the study focus was on a different topic. For example, Janssen and Wagenaar (2006b) discuss shared services success factors (with minimal focus on investigation of the factors) as they present a framework that analyses motives to use a shared services centre. Often the empirical evidence provided to support the success factors, is narrow [i.e. limited to a single case study (e.g. Borman, 2010) or archival analysis (e.g. Miskon, et al., 2011)] or the reported outcomes are highly contextual [e.g. in the e-government context (e.g. Janssen & Wagenaar, 2004), in the non-profit Sector (e.g. Walsh, et al., 2008)].

The study reported herein aimed to overcome several of the limitations of prior work through conduct of an in-depth multiple case study of shared services success factors in the Higher Education (HE) sector. Though the HE sector appears particularly well poised to benefit from shared services, it has received minimal attention in the academic literature. It should also not be assumed that findings to date in other sectors apply directly to HE (Burke, 2005).

A structured approach was devised and applied to systematically identify the success factors of shared services and their relationships as observed in ICT related shared services in HE. The remainder of this paper proceeds as follows. First the research method is described. Next, findings from the case study evidence are discussed. The paper concludes with a summary and suggestions for future research.

RESEARCH DESIGN

The multiple case study approach employed emphasized qualitative analysis. It facilitated conduct of the study in a natural setting; to generate theory from practice, simultaneously enabling understanding of the nature and complexity of the phenomenon investigated (Benbasat, Goldstein, & Mead, 1987; Yin, 2009). This approach is particularly suited to researching an emerging area in which few previous in-depth studies have been conducted (Lee, 1989; Yin, 2009). A multiple case design is desirable when the intent is to build and test theory (Yin, 2009). A single pilot-case study and subsequent multiple case studies were employed in this research. The pilot case study was conducted solely to prepare for the multiple case studies. The primary goal of the multiple case studies was to inductively identify potential success factors of shared services from the case data, and later substantiate these success factors using evidence from the literature.

The study focused on ICT related/supported shared services in the HE context. A literal replication approach (Yin, 2009) was employed, where similar organizational settings are selected. The case studies were conducted in public universities in Malaysia. Malaysian universities are experiencing many of the same environmental drivers as universities elsewhere, encouraging a shared services approach (e.g. increased competition, reduced funding, pressures for operational efficiency improvements). The HE sector in Malaysia has been actively considering shared services as part of a nationwide strategic imperative for some time. The study team had good access to public universities in Malaysia that were interested in participating. Three public universities in Malaysia were included in the study. We use the pseudonyms; Uni_Q, Uni_R and Uni_S (to maintain confidentiality). The main study site was Uni_Q, where the majority of the data collection took place. Uni_Q was chosen as the primary site as: they had implemented several different sharing arrangements; the Uni_Q ICT project leaders also held leading roles in other relevant inter-organizational sharing arrangements at a national level; and for feasibility reasons (i.e. ready access to people through known networks). Interviews were also conducted at the Uni_R and the Uni_S.

A thorough investigation into success factors, requires insights from those who are directly involved in the area of study. This study was about ICT shared service, hence institutional and department heads responsible for providing and managing IT in each organization were sought as case study participants. Interviews were planned with the major decision makers and implementers of these decisions, i.e. those who influence, or are influenced by, existing and

potential sharing arrangements in ICT projects. A total of 9 interviews were conducted (see Table 1).

Table 1: Overview of case study participants

	University	Role	Years of experience in current role
1	Uni_Q	ICT Director	3 – 5 years
2	Uni_Q	Deputy ICT Director	5 – 10 years
3	Uni_Q	ICT Project Leader	5 – 10 years
4	Uni_Q	ICT Project Leader	5 – 10 years
5	Uni_Q	ICT Project Leader	5 – 10 years
6	Uni_Q	ICT Project Leader	5 – 10 years
7	Uni_R	ICT Director	More than 10 years
8	Uni_R	Deputy ICT Director	3 - 5 years
9	Uni_S	Deputy ICT Director	5 – 10 years

A case study protocol was designed, carefully documenting all procedures relating to the data collection and analysis phases of the study (Benbasat, et al., 1987). Qualitative data collection mechanisms including in-depth interviews, and content analysis of existing documentation were used to collect ‘rich’ evidence about the shared services initiatives and the respective higher education institutions investigated. Observations and documentation were used to augment and corroborate interview data, which was the main input to data analysis. The interviews were semi-structured; each completed within 60-90 minutes, conducted in the Malay language and later transcribed and translated into English. All interviews followed the same structure and format (as pre-specified by the case protocol), commencing with an open discussion on understanding and perception of shared services and perceived potential benefits, followed by their perceptions of success/failure factors for shared services.

All relevant data (interview transcripts, research memos, documents about the sharing arrangement, etc.) were maintained in a ‘case database’ (Miles & Huberman, 1999; Yin, 2009). Throughout the analysis, close linkages between the research questions, evidence, interpretations and conclusions were maintained, supported by the qualitative data analysis tool NVivo 9.0. Two coders independently coded the content; inter-coder reliability was high (NVivo calculates percentage agreement individually for each combination of node and source; percentage agreement is the percentage of the source’s content where the two users agree on whether the content may be coded at the node). The percentage agreement was more than 90% across all coded content (all Kappas were over .85). In general, an agreement percentage of 80% or more is considered acceptable in most situations, as are kappa coefficients of .80 or greater (Lombard, Snyder-Duch, & Bracken, 2010). Construct validity was strengthened within the study through the use of multiple sources of evidence, establishing a chain of evidence with a well-structured case database, and by having key informants review draft case study reports at the completion of data analysis at each case site. Predictive validity was increased through data analysis techniques such as pattern matching and explanation building (Yin, 2009). External validity or extensibility of the findings has been improved through the conduct of multiple cases studies.

STUDY FINDINGS

The Interview data were analyzed within NVivo 9.0 in an inductive manner. Themes were captured via in-vivo inductive coding (coding with the key words identified within the text). At times, literature was used to identify and/or further strengthen the identified themes, influenced by prior literature. These themes were then grouped within meta-categories (which subsumed the detailed set of initial themes) and these meta-categories formed the final set of success factors. Ten success factors were identified, namely;

1. Understanding of Shared Services and the Notion of Sharing
2. Organizational Environment
3. Top Management Support
4. IT Environment
5. Governance Procedures
6. Process Centric View
7. Implementation Strategy
8. Project Management
9. Change Management
10. Effective Communication

Table A.1 of Appendix A, presents a summary of the factors identified through this effort. While the table includes counts of citations and sources (interviews) as observed from the case data for each factor, the intent is not to imply degree of importance of a factor, but merely identification for model/ theory building purposes. To ensure the identified factors were as complete as possible, those that had very low citations were also included. The relative importance of these factors (within different contexts) needs to be investigated in future research. The results are discussed in detail below.

INTRODUCING THE SUCCESS FACTORS

SF1: Understanding of Shared Services and the Notion of Sharing

The case study data pointed to “understanding of shared services and the notion of sharing” as a critical element for success. In particular the data suggested that in order to successfully proceed with a shared services arrangement, the key stakeholders should (i) understand what resources are available within the participating entities, (ii) have a clear understanding of sharing requirements, and also (iii) understand what can (and can not) be shared. The data indicated that sharing occurs best when common processes and routine processes are those selected to be shared, and the shared processes/ functions are those in demand (needed) by a majority of the participants.

Evidence from the literature supports these observations. Miskon et al. (2011) identify “*Knowing ‘what’ is to be shared*” as a success factor, stating that there needs to be a systematic approach to appraising what should be included and what should not, within a shared services arrangement. Goh et al. (2007) identified awareness that “*not all activities can be shared*” as a success factor of their shared services model. Borman (2008, p. 7) states that “*The majority of SSCs [shared services centres] felt that it was important to take an end-to-end process perspective on the services*” – implying the need to clearly understand the processes and the related context being shared. Borman (2010, p. 222) states that “*the extent to which shared service tasks are routine*

and provided in their entirety” is a characteristic of successful shared service centers, reinforcing the notion that routine processes are better suited for sharing.

SF2: Organizational Environment

Organizational environmental factors are those elements that come from within the organizational context in which the shared services take place. The case studies suggested these organizational contextual elements were important factors, and in particular implied value from two such factors. Firstly, that the entities involved in sharing had a prior collaborative relationships of some sort. This notion is supported in the literature. For example Becker et al. (2009) state *“It is assumed that an emergence of shared services depends on whether certain forms of cooperation existed already before”* (Becker, et al., 2009, p. 3).

Case data also emphasized a second organizational factor - the need to have process champions involved.

“Champion here refers to an individual who knows their business processes inside out. They are knowledgeable about the various processes responsible for the university activities – specifically to their field. For example, in HR, there is staff that really knew the HR processes from A to Z”. (Deputy ICT Director, CICT- Uni_S)

Management support might also be perceived as an organizational environmental factor, however this is presented as a separate success factor due to the strong emphasis it received both within the case data and in prior literature.

SF3: Top Management Support

Top management support was stated as one of the most important factors for the success of shared services. Top management support is defined in this context as the involvement and participation of senior management, and their ongoing commitment and willingness to devote necessary resources and time to oversee the shared services initiative.

Top management support is one of the most commonly cited success factor across a variety of organizational initiatives, and has also been cited as a critical element in prior shared services literature (e.g. Borman, 2010; Miskon, et al., 2011) . Becker et al. (2009, p. 2) state, *“management support and leadership are crucial success factors for the implementation of shared services...”* and *“the role of such key actors has to be taken into account when examining the emergence of shared services”* . It is important that top management understand requirements, proposed changes, and proper structuring of the shared services initiative (Goh, et al., 2007; Ulbrich, 2006). Ulbrich (2006, p. 201) specifically counsel *“first, assure that management is committed to the suggested change project”* .

SF4: IT Environment

IT environmental factors are those factors that are from the broader IT context in which the shared services occur. The case studies identified three such factors as playing a significant role in successful ICT related shared services: (i) centralized, standardized and integrated IT platforms, (ii) clearly defined IT requirements, and (iii) strong IT capabilities. These findings are supported by the literature. Borman (2008) suggests a common IT platform (like an ERP) is an essential element of shared services; standardization and integration enable such common IT

platforms. The importance of strong IT capabilities is also supported by prior literature. Miskon et al. (2011) reported this as the most commonly cited success factor they distilled from archival analysis of IS shared services literature. Fonstad and Subramani (2009) found that strong IT capabilities help shared services by building credibility with their business partners. They state that *“To improve their working relationship with the rest of the firm, those responsible for enterprise-wide IT resources first made sure they had developed the capabilities to run a shared services organization well.”* (p. 34).

SF5: Governance Procedures

Walsh et al. (2008, p. 203) argue that *“ensuring there is an effective governance arrangement in place”* is consistently identified as a key factor in the implementation of shared services. We too observed this within the case study data, with all nine interviewees mentioning this. Governance in this context is defined as the system by which the shared services are directed and controlled, and includes the processes and mechanisms established to enable the shared services to function.

The case data emphasized the need for clearly defined responsibilities and decision rights for the shared services centre(s) and business areas. This is reinforced by Borman (2008) who argues for establishing clear allocation of responsibilities (and good relationships) amongst the SSC and the business areas it serves.

The case data also pointed to the value of establishing reward systems within the shared services context. Interviewees argued for systems designed to reward the service providers; *“to increase the motivation of staff involved to continue to maintain their excellence in providing services”* (ICT Director of CICT – Uni_Q) and also for systems designed to reward the users of the shared arrangement; e.g. *“giving award to the excellent users in the E-Learning usage. This is very important to ensure the use of E-learning can be sustained in the teaching and learning processes”* (ICT Director, CICT – Uni_Q).

Another governance aspect identified from the case studies was the benefit of mandating shared services. The case participants argued that until the value of sharing is perceived by the business areas (in the case of this data set, these were different universities and faculties), people will still ‘prefer to do their own thing’. The cases included scenarios where the mandate came from university level leadership roles like the Vice Chancellor (VC) (mainly for intra-organizational shared services) and/or the Ministry of Higher Education (MOHE) (mainly for inter-organizational shared services). Borman (2008, p. 8) describes how shared services initiatives can be mandated to achieve desirable benefits or objectives and also states that by mandating shared services, an organization is able to conduct reforms efficiently and deliver improved value for money *“you don’t want to weaken your economies of scale if you start picking and choosing”*. Miskon (2011) also identifies ‘not mandating’ the use of shared services as a potential failure factor.

SF6: Process Centric View

A process centric view encourages viewing and approaching organizational tasks based on their related business processes (rather than the tasks or functions they perform). Walsh et al. (2008) explain how business process redesign through standardizing processes and removing unnecessary steps in order to optimize productivity and flow of work, is an essential requirement

at some point in the implementation of a shared services model. Borman (2010) also found that there is a need for a thorough process and work-level understanding. He states *“One of the hardest, but most necessary, things to have in place before moving to shared services was seen to be a good understanding of how the impacted processes work”* (p.10). The case data also identified this need to have a clear understanding of the processes and how the impacted processes work. Evidence showed how task forces were put in place to achieve this goal.

The case data also pointed to the need to have standardized processes (26 citations across 5 of the interviews). One of the interviewees summarizes the need for standardized processes stating; *“for me, process standardization contributes to both the effectiveness and efficiency of internal control by improving the organization’s awareness, reducing variation, and eliminating duplication. In addition, standardizing technology — for example migrating to a common standardization systems — reduces the number of system setups, interfaces, security profiles, and manual workarounds, all of which streamline control design and testing”* (ICT Director, CICT – Uni_R). Process standardization is identified as an important aspect in prior studies. Su et al. (2009) state that standardization (i.e. standardizing processes and technology across business and geography), is one of the transformation steps when implementing shared services. Goh et al. (2007) report that standardization in the form of common business processes and common IT applications is an important justification for the migration to a shared services model. The case data showed the need for having process performance measures in place. Borman (2008) regards a ‘measurement emphasis’ as a fundamental foundation for success in shared services. Borman (2010) makes a similar argument for the need to have performance monitoring in place stating that it is *“the means by which the performance of the SSC is enabled and monitored”* (p. 223)

SF7: Implementation Strategy

The case interviewees commented on the relevance and importance of the implementation strategy. They particularly commented on the value of (i) adopting a green field approach, (ii) integrating within silo’s first, and (iii) using mental models to communicate the solution to be implemented.

Borman (2008) too suggests that there is value in having a ‘green-field approach’ for shared services initiatives; that is, to start the shared services initiative from scratch. This enables a smoother transition, with the revised roles, responsibilities and expectations clear from the start. Miskon et al. (2011) also list ‘Adopt a green-field approach’ as a success factor.

Project Management was also often mentioned in the case data when implementation was discussed, however this was deemed a separate success factor and is presented next.

SF8: Project Management

Project management was identified as a success factor within the case data. It is defined as; the effective and efficient management of activities and resources for the shared services initiative from inception to implementation. As depicted in Table 1, two key themes were emphasized in the case data in relation to project management; (i) team work; where the parties involved in operationalizing the shared services would function collaboratively as a team, and (ii)

stakeholder involvement; where all parties effected by the shared services are informed and consulted.

Miskon et al. (2011) too list project management as a shared services success factor. Lacity and Fox (2008) emphasize the value in keeping ‘transition managers’ to project manage the initiative, until the new service model is fully stable. In IT related studies outside of the shared services domain, project management is also often listed as a critical success factor (e.g. Al-Mashari & Zairi, 1999; Bandara, et al., 2005; Bingi, 1999).

SF9: Change Management

Change management was mentioned in the case data as an important factor for success. In this context we define change management as; a structured approach to transitioning those involved - individuals, teams, and organizations - from a current state to a shared services model. This is essential as, creating shared services can require radical transformation of business processes and information technology (Lacity & Fox, 2008). As stated by Borman (2008) *“It is necessary to carefully manage the change for the employees of the SSC and the rest of the organization”* (p. 9). Lacity and Fox (2008) also identified the importance of effective change management. Effective communication emerged as the primary theme around change management within the case study data, but this was later positioned as a success factor in its own right, due to the strong emphasis on this in the case study data (with 25 citations) and the past literature (e.g. Bandara, et al., 2005; Brash, 1999; Miskon, et al., 2011; Stefanou, 1999) that listed this as a separate success factor. Effective communication is further discussed below. The other themes that emerged from the case data in relation to effective change management were (i) expectation and perception management, (ii) developing and securing common norms, (iii) establishing good relationships with the business, and (iv) emphasizing the need for shared services.

SF10: Effective Communication

The need for effective communication (i.e. the effective exchange of information amongst the stakeholders involved with the shared services initiative) was highlighted in the case data. This has been a noted critical success factor in prior shared services studies (e.g. Goh, et al., 2007; Janssen & Joha, 2006a) and also other IS project related studies (e.g. Al-Mashari & Zairi, 1999; Stefanou, 1999). Goh et al. (2007, p. 253) describes how new levels and kinds of communication are needed when establishing shared services, as *“all members of the new Shared Services unit are expected to interact and be interactive”*. Examples from the literature on effective communication practices include: early education on the change management process (Ulbrich, 2006), marketing the message with tools like brochures (Sia, Soh, & Weill, 2008), a regular review process to help business unit leaders see the value of shared services (Weill, 2004), and by listening and addressing adequately those issues raised by employees (Borman, 2008; Goh, et al., 2007; Lacity & Fox, 2008). Communication between users and the SSC is a key capability that affects the shared service process performance (Janssen & Joha, 2006a).

The case study data pointed to a few sub themes around effective communication, which are illustrated with supporting evidence in Table A.1. These included the need to (i) have a communication strategy, (ii) have a common language, (iii) build awareness and market the sharing arrangement, (iv) build rapport with those involved, (v) discuss readiness to proceed with a sharing arrangement, and (vi) involve users and stakeholders.

Summary View of Inter-relationships within the Success Factor Model

In summary, the study suggested 10 success factors of shared services (see Figure 1 for an overview). Table A.1 of Appendix A, presents supporting evidence for these factors from the case data and also lists sub-factors that form the main factors, as supported by case study evidence.

Having identified and substantiated the success factors, potential interrelationships amongst the factors were investigated. A limitation of most success factors studies is the constrained attention to direct effects only. Sharma and Yetton (2003, p. 534) argue that *“this approach neither reflects the richness of the theory, nor provides a good description or explanation of the relationship. The main-effects model needs to be extended to capture the complexity of the relationship”*. Identifying potential interrelationships amongst the factors can provide a foundation for the further operationalization of the constructs. These interrelationships may help explain possible overlap between the constructs if and when the success factors model is quantitatively operationalized to function as a prediction model (i.e. to predict success). Hence, this study explored potential inter-relationships amongst the factors, by running matrix intersection queries using the NVivo tool. A Matrix Intersection search is a two-dimensional type of Boolean search made available through NVivo. It takes the searched feature from two collections at a time, and finds passages in the documents or nodes in which the search term is contained in both - thus indicating possible overlap and/ or relationships. Figure 1 and Table 2 provide the summary results of this analysis.

Figure 1: Shared Services Success Model: Factors and the Inter-relationships

There were three ‘part of’ type relationships identified from the data set, meaning that though indicated as separate factor, conceptually they belonged together within another factor. **Top Management Support**, can be considered as an **Organizational Environment** factor [see frame ‘x’ in Figure 1], **Project Management** can be regarded as a sub category within **Implementation Strategy** [see frame ‘y’ in Figure 1], and **Effective Communication** can be viewed as a sub category within **Change Management** [see frame ‘z’ in Figure 1. This was explained earlier when these factors were presented in the section above.

Several potential interrelationships were identified. The **Understanding of Shared Services and the Notion of Sharing (SF1)**, in particular the understanding of sharing requirements, can influence the **IT Environment (SF4)**, by enabling the better definition of the IT Requirements [see path (a)]. An **Understanding of Shared Services and the Notion of Sharing (SF1)**, can also influence the standardization processes, a core aspect of the **Process Centric View (SF6)** factor [see path (b)]. Path (c) indicates how **Understanding of Shared Services and the Notion of Sharing (SF1)** can also influence **Change Management (SF9)** in particular influencing the development of common norms.

Top Management Support (SF3) influences many other factors. It particularly influences **Governance Procedures (SF5)** by contributing towards the establishment and execution of reward systems and may be the authority that mandates the shared services arrangement [see path (d)]. **Top Management Support (SF3)** can influence the **Process Centric View (SF6)** factor, in particular with establishment and execution of process performance measures [see path (e)]. **Top Management Support (SF3)** influences **Project Management (SF8)** practices, by supporting and encouraging team work and stakeholder involvement [see path (f)]. **Top Management Support (SF3)** influences **Change Management (SF9)**, by playing a mediating role when developing common norms and by being a vital figurehead emphasizing the need for shared services [see path (g)]. **Top Management (SF3)** can also be the spokes persons who build awareness and market the sharing arrangement, hence influencing the **Effective Communication (SF10)** success factor [see path (h)].

Governance Procedures (SF5) can influence the **Process Centric View (SF6)** factor, in particular the setting up and execution of process performance measures [see path (j)]. **Effective Communication (SF10)** can influence good **Project Management (SF8)** [see path (l)], as having a common language and a communication strategy can support the management of activities and resources for the initiative.

A potential correlation relationship was observed between the **IT Environment (SF4)** and **Process Centric View (SF6)** factors [see (i)], where interdependencies within the two were observed. For example, the nature of the IT environment can influence the process centricity (i.e. how the processes were standardized), and the nature of the processes can influence how centralized, standardized and integrated the IT platforms are. A similar relationship was observed between **Project Management [SF8]** and **Change Management [SF9]** [see (k)].

CONCLUSION: CONTRIBUTIONS, LIMITATIONS AND OUTLOOK

Shared services provide organizations with the opportunity to reduce costs, increase quality and create new capabilities. Though there are numerous publications on shared services, there is a dearth of knowledge about what contributes to shared services success. This study addresses this gap by investigating the success factors of shared services and deriving a shared services success factors model based on a detailed inductive analysis of multiple cases within the HE sector of Malaysia. The resulting shared service success factors model (Figure 1) includes 10 success factors and their inter-relationships: (1) understanding of shared services; (2) organizational environment, (3) top management support, (4) IT environment, (5) governance, (6) process centric view, (7) implementation strategy, (8) project management, (9) change management and (10) communication. While several of these, such as management support, implementation strategy, project management, change management, governance and communication, are quite generic to many other ICT implementations, several unique factors or unique sub-factors were identified. For example, understanding of shared services is a factor that is unique to the context of shared services. Certain sub-factors of the more generic factors were more emphasized in this study. For example, having prior collaborations (a sub-factor within the organizational environment factor) was seen as a core supportive aspect for shared services. Similarly, centralized, standardized and integrated IT platforms (a sub-factor of the IT environment) and having standardized processes (a sub-factor of the process centric view factor) were observed particularly prominently in the shared services context.

The study entails several important contributions to both research and practice. It provides an empirically based model of antecedents of shared services success, especially within the context of ICT related shared services in the HE sector. The model in Figure 1, deriving from inductive matrix intersection searching, combined with deductive reference to the relevant literature, presents a preliminary theory of shared services success. The study provides guidance on what to consider when conducting shared services in practice.

The study has several limitations. There were inherent limitations in the case study design and conduct. The results presented here were limited to three case sites, where analysis was based on interviews of selected stakeholders (i.e. the directors and higher level ICT managers of the selected universities). The study was also prone to the more general limitations of case study research such as case selection bias, analysis limitations due to only nine interviews, and researcher bias in data collection and analysis. The possibility of researcher bias was mitigated by the use of multiple coders and high inter-coder reliability. It is acknowledged that these limitations could have impacted the completeness of the final model presented. Furthermore, though potential relationships among the identified success factors were analyzed, no consideration was given in either data collection or analysis to potential contingency factors (i.e. moderating or mediating factors or relationships).

A range of future work is suggested and planned to extend this study. Design principles for practice that provides detailed guidelines on how to achieve and manage the identified success factors, are being formulated. An extension of the study is planned, to conduct further cases from other organizational and process contexts, to further extend and validate the model beyond the HE sector, to identify potential contingency variables and to identify potential dependent variables (to measure the success of shared services). These cases will also be used as input to

construct operationalization for a global survey intended to validate the extended shared services success model; results of which will yield insights on the relative importance of the success factors.

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Appendix A

Table A.1: Overview of the success factors with supporting case study evidence

Success Factors		Interviews	Citations	Sample Evidence
1	Understanding of Shared Services and the Notion of Sharing	5	25	
i)	Understand what resources are within the participating entities	2	3	<i>"Sharing this kind of system (in this context) can be realized when the other universities understand and accept exactly what we have in such a system" (Deputy ICT Director, CICT - Uni_Q)</i>
ii)	Have a clear understanding of sharing requirements	2	5	<i>"... before proceeding with any sharing arrangement, it is important to have a set of university requirements" (Deputy ICT Director, CICT - Uni_Q)</i> <i>"Sharing is a continuous process. Before starting... we need to have an agreement of common requirements agreed by all parties involved" (ICT Project Leader 3, CICT - Uni_Q)</i>
iii)	Understanding what can (and cannot) be shared	4	18	
-	Sharing is best when: common processes are shared	2	9	<i>"we can move towards sharing or shared services when the work flows within an application are similar between the universities Common processes are one of the important aspects of sharing activities. Common processes should be promoted and developed across universities for sharing" (Deputy ICT Director, CICT - Uni_Q)</i>
-	routine processes are shared	1	3	<i>"Sharing has been most successful where the functions <shared> are relatively routine" (Deputy ICT Director, CICT - Uni_Q)</i>
-	what is shared is needed by the majority	3	6	<i>"... indeed we will develop the system or the improvement when it is needed by majority of the units/faculties.... even though the instruction may come from the top management, I still make sure that kind of system/module will be used by all units/faculties that are related with that kind of system/module. That it is needed not only by one unit/faculty" (ICT Director, CICT - Uni_R)</i>
2	Organizational Environment	3	4	
i)	have process champions involved	2	3	<i>"Champions are very important for sharing initiatives – in particular their knowledge and experience in implementing certain business processes and projects related with the processes. Successful sharing initiatives require champions who are passionate about the project and willing to promote its benefits to others. These champions need to be identified and involved in the planning process of these sharing initiative" (Deputy ICT Director, CICT - Uni_S)</i>
ii)	having prior relationships or corporations	3	3	<i>"The most important thing, there must be collaboration between public universities with projects related with sharing. Besides that, the public universities are willing to implement the sharing initiative and also share the responsibilities throughout the sharing implementation" (ICT Project Leader 1, CICT - Uni_Q)</i>

				<i>"I would say and believe that relationship management is the key to building strong partnerships. For me, developing trust between internal units in Uni_S is fundamental to successful internal sharing initiatives and needs to occur before sharing the initiatives externally are implemented"</i> (Deputy ICT Director, CICT - Uni_S)
3	Top Management Support	6	26	
				<p><i>"Support from top management is one of the important factors. Top management means the Ministry of Higher Education (MOHE)... Top management should encourage all universities to look into this and if possible share the resources amongst universities"</i> (Deputy ICT Director, CICT - Uni_Q)</p> <p><i>"Support from the top management is very important to make sure the implementation of these sharing projects can be implemented successfully. Without the support from top management these systems would not be possible to succeed"</i> (ICT Project Leader 1, CICT - Uni_Q)</p> <p><i>"the sharing activities occurred when there was a direction from the top management people – the Vice Chancellor. Several units in the university were sharing their processes by using one application. When there is a mandate from the top management, then several units will cooperate with each other to share any kind of services... Other than that, it is very important to have commitment and high level leadership such as MOHE or the university's top management to ensure the successfulness of these sharing initiatives across universities or within university"</i> (Deputy ICT Director, CICT - Uni_S)</p>
4	IT Environment	9	25	
i)	Centralised, standardised and integrated IT plat forms	5	22	<p><i>"The key to excellence in information delivery is to standardize the central system and customize the delivery....this means consolidating all your data into a central database and integrating to allow users to access content through any application. Information delivery improvements from shared services arrangements may result from increased use of cross functional applications by enabling the integrated data."</i> (ICT Director, CICT - Uni_R)</p> <p><i>"In my opinion, it is very easy to manage if all resources are centralized"</i> (ICT Director, CICT - Uni_R)</p> <p><i>"It would be good to have all data integrated at the first place... From the user perspective, this is very important because the user can achieve the desired data quickly"</i>(ICT Project Leader 3, CICT - Uni_Q)</p>
ii)	Clearly defined IT Requirements	8	18	<p><i>"However, before proceed with any sharing arrangement, it is important to have a set of university requirements. The solutions must be based on university requirements and align with IT capabilities... We also need to have an agreement of common requirements agreed by all parties involved... Make sure the sharing initiatives are able to meet all the users' needs/requirements. As a HR team we need to make sure all users are satisfied with the services provided. No use to have the sharing initiative if we are unable to satisfy the parties involved in terms of their needs/requirements"</i> (Deputy ICT Director, CICT - Uni_Q)</p> <p><i>"It is very important to conduct the detailed requirement analysis. This is to identify the weak links in business processes and allows the system fit with the university's overall business processes. Furthermore it is important to make sure and to have the system specification is agreed upon by the stakeholders group and sometimes this will consume more time in deploying the system"</i> (Deputy ICT Director, CICT - Uni_R)</p>
iii)	Strong IT Capabilities	4	8	<p><i>"IT capabilities are very important to simplify and automate the common processes across universities... in my opinion, in terms of choosing a partner for sharing initiatives, we should take a hard look at their IT capabilities, including their flexibility and their desire to invest in systems to make it easier to automate and centralize the processes"</i>(Deputy ICT Director, CICT - Uni_S)</p> <p><i>"... adequate infrastructure in terms of hardware and networking are crucial for this project success. Inadequate infrastructure capabilities will lead to failure"</i> (ICT Project Leader 2, CICT - Uni_Q)</p>

5	Governance Procedures	9	34	
i)	Clearly define responsibilities for the shared services centre(s) and business areas.	4	10	"A shared services initiative is a team effort that requires full participation from the business units, faculties and the implementation teams. Hold these groups accountable to encourage cooperation" (Deputy ICT Director, CICT - Uni_S) "In sharing, it is important to establish the concept of clear ownership and all units involved must have collective agreement" (ICT Project Leader 2, CICT - Uni_Q)
ii)	Establish reward systems for the sharing context	4	6	"The most important way to make sure all are happy is a reward. I think reward systems are the mechanisms that make this happen. You get what you are rewarded on" (ICT Project Leader 3, CICT - Uni_Q) "Basically organizations don't want to be bothered with activities for which they wouldn't be rewarded, even though in theory it can be shown that by combining resources each organization will benefit". (ICT Project Leader 4, CICT - Uni_Q)
iii)	Mandating the shared services arrangement	5	18	"...if it is not enforcement of a higher authority; quite difficult to implement the sharing concept <mandating> encourages each university to work through their differences. Furthermore, it creates a need to establish relationships with all stakeholders involved and requires patience and sustain persistent. Maybe it will take some time to get everyone realize the benefits of sharing, <where mandating will then not be required>" (Deputy ICT Director, CICT - Uni_Q) "if there is no <mandatory> direction from the ministry, universities will not use this application ...each university will try to replicate what has been developed..." (ICT Director, CICT - Uni_Q)
6	Process Centric View	6	33	
i)	Understanding of how the impacted processes work	3	3	The case data pointed to example task forces that were set up to look at the impacted processes, their primary role been to understand the sharing requirements and to see how the processes had to be re-configured to meet these requirements. "they looked at how the processes fitted with user needs and organizational requirements...The more complex the scenario, the more important the analysis" (Deputy ICT Director, CICT - Uni_S)
ii)	Have standardised processes	5	26	"If we want to move towards sharing, there should be a kind of standardization agreed between the involved universities" (Deputy ICT Director, CICT - Uni_Q) "For me, in sharing environment – standardization plays important role. Service is more reliable through standardization - easily to customize and configure in the future according to your specific needs and document flows. It is just right for shared arrangements wanting to add on more processes over time" (ICT Director, CICT - Uni_R)
iii)	Have process performance measures in place	2	3	"the monitoring and evaluation of processes need to be built into the initiatives. Emphasis must be placed on evaluating the planning, implementation and collaboration processes – to make sure of the initiative's success" (Deputy ICT Director, CICT - Uni_S)
7	Implementation Strategy	5	7	
i)	Adopting a green field approach	4	4	"green-field" development is very important...We had developed our main systems from scratch... Therefore, such systems were aligned with the university's requirement" (Deputy ICT Director, CICT - Uni_R)
ii)	Using mental models	1	2	"We have mental model – the development course as a guideline....Mental models are a means by which organizations and individuals create and share meaning, enabling a common understanding of any projects, especially the shared ones...The more complex the scenario, the more important the analysis of the current context..the used of mental models allow us to ensure the system is useful and actually used – meets the user needs or requirements" (Deputy ICT Director, CICT - Uni_S)
8	Project Management	7	27	
i)	Team work	4	13	"First of all, the most important factor in ensuring successful shared systems is teamwork... Team members should

				<i>participate in establishing shared values and common goals. Be committed to these goals, and have a feeling of interdependence and ownership for their jobs and unit.... trust is very important in teamwork where there is a shared belief that you can depend on each other to achieve a common purpose. Furthermore teamwork will help to reduce confusion within a group and introduce a more clear understanding between its members. Teamwork creates a shared sense of group identity" (ICT Project Leader 3, CICT - Uni_Q)</i>
ii)	Stakeholder Involvement	5	13	<i>"We should never say 'we know what is best for you' Always ask the users what they want to include into the system" (ICT Project Leader 3, CICT - Uni_Q) "It is important to increase involvement of faculty, staff and students in this kind of initiative" (ICT Project Leader 4, CICT - Uni_Q)</i>
9	Change Management	9	22	
i)	Expectation and perception management	5	8	<i>"All universities need to understand the objectives of the project...and know what to expect and by when" (Deputy ICT Director, CICT - Uni_Q)</i>
ii)	Developing and securing common norms	5	10	<i>"The sharing initiatives need to develop a strong, clear, appropriate and common mission, vision, purpose with clear objectives and most important – they must be achievable. We experienced the greatest success, documenting the explicit objectives, of what we want to achieve in a specific timeframe. We revisited them at each meeting to ensure progress....Without that strong direction, business units or faculties won't work together, and some individuals will sit on the sidelines waiting for it to all go away" (Deputy ICT Director, CICT - Uni_S)</i>
iii)	Establishing good relationships with the business	3	11	<i>"The relationship between the owner, user and CICT <the shared system> are created since the early phases of system development until the system has been implemented. This is very important in order to absorb and make use of the new information and to further support the requirements that should be included in the system design" (ICT Project Leader 1, CICT - Uni_Q)</i>
iv)	Emphasizing the need for shared services	5	10	<i>"MOHE should set up a target, let say by 2020 we should implement sharing as a strategy for avoiding duplication effort. If you do not do this, all universities will keep doing the same thing – establishing their own data centre because of they need it.... Top management should encourage all universities to look into this and if possible share the resources amongst universities" (Deputy ICT Director, CICT - Uni_Q) "The university management should encourage teamwork and collaboration towards sharing goals. I think this is a good approach and important to show the need to share, show how an organization's effectiveness can be improved with sharing initiatives... Most universities want to maintain their own business requirements. Maybe the top management such as MOHE or the university itself should promote the awareness and need of sharing initiatives" (Deputy ICT Director, CICT - Uni_S)</i>
10	Effective Communication	8	25	
i)	have a communication strategy	2	3	<i>"The issue is you need really need to make others understand what are you are trying to achieve. Hence, we need an effective internal and external communication strategy. When communication was clear and information sharing was effective. All universities need to reach agreement on the vision and the collaboration. Therefore it is important to managing communication and information sharing what is currently plan for the next 3-5 years" (Deputy ICT Director, CICT - Uni_Q)</i>
ii)	have a common language	2	4	<i>"In order for a group of people to become a real team they will need to establish a common language and way of making themselves understood to one another" (ICT Project Leader 3 - Uni_Q)</i>
iii)	build awareness and market the	2	3	<i>"Marketing the shared application or services is very important to let others know the existence of these services and</i>

	sharing arrangement			<i>implement or use these services/software. One of the ways is through effective communication. Marketing by telling others, via internet – put on your portal or website, provide classes – train how to use or implement the shared software or system or services, and also it also can be done by using flyer or pamphlet" (ICT Director, CICT - Uni_R)</i>
iv)	build rapport with those involved	2	3	<i>"A rapport must be established in which people can have confidence both that they are being understood and that they understand the other person" (ICT Project Leader 3 - Uni_Q)</i>
v)	discuss readiness to proceed with a sharing arrangement	2	2	<i>"MOHE and all universities should openly discuss the organizations readiness to move forward with this sharing strategy... Readiness should be in terms of hardware, systems, resources and also procedures" (Deputy ICT Director, CICT - Uni_Q)</i>
vi)	involve users and stakeholders	2	3	<i>"always ask user what they need" (ICT Director, CICT - Uni_R)</i>